News release

Natural fluctuations can help predict climate change

21 November 2005

Predictions of future climate change have, until now, been based on simulations of the effects of increasing greenhouse gases. However, new results show we could learn more about climate in the next few decades by supplementing these with predictions of a natural climate cycle: the Atlantic Multidecadal Oscillation or AMO.

The AMO is a climate fluctuation which occurs over several decades, whose warm and cool phases can be traced back in global records dating from the 19th century. Its effects are centred on the North Atlantic Ocean, but it appears to influence many parts of the Northern Hemisphere. Scientists have previously found links with European and North American climate, drought in the semi-arid African Sahel region, and the frequency of Atlantic hurricanes. Indeed, the record 2005 hurricane season is part of the very active last decade associated with the current warm AMO phase.

To test whether the AMO is a permanent feature of our climate, Met Office scientists, with colleagues in the United States, examined a 1,400-year climate model calculation. They discovered that not only could the AMO be accurately simulated by their model, but that it is a genuine long-lived climate oscillation.

The Met Office team then tried to link the AMO to variations in the strength of the thermohaline circulation (THC) — the global ocean circulation driven by differences in the density of sea water — and found that the next AMO transition may bring natural THC weakening, adding to that projected to occur as a result of human-induced climate change.

A paper, soon to be published in the American Geophysical Union's journal *Geophysical Research Letters*, highlights these recent breakthroughs, and recommends that shifts in the AMO are taken into account in future climate change predictions.

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